# E. APPENDIX E
# BMPs FOR PROTECTION OF WATER QUALITY

## E.1 BMP EFFECTIVENESS

Forest Management activities and associated road building in steep rugged forest terrain have long been recognized as sources of non-point water pollution. Non-point pollution is not, by definition, controllable through conventional treatment plant means. Containing the pollutant at its source, thereby precluding its delivery to surface water, controls non-point pollution. Sections 208 and 319 of the Federal Clean Water Act, as amended, acknowledge that land treatment measures are effective in controlling non-point sources of water pollution. The Act emphasizes development and use of such measures on the ground where appropriate.

The Forest Service developed and documented non-point pollution control measures applicable to National Forest System Lands. The measures were certified by the State and approved by the EPA as the most effective means the Forest Service could implement to control non-point source pollution. These measures were termed "Best Management Practices" (BMPs).

BMP control measures are designed to accommodate site-specific conditions. They are designed to account for the complexity and physical and biological variability of the natural environment. The implementation of BMPs is the performance standard against which the success of the Forest Service's non-point pollution water quality management efforts are judged.

The Clean Water Act provided the initial test of effectiveness of the Forest Service non-point pollution control measures. It required the evaluation of the practices by the regulatory agencies (State Board and EPA) and the certification and approval of the practices as the "BEST" measures for control. Another test of BMP effectiveness is the capability to custom fit the measures to site-specific conditions where non-point pollution potential exists. The Forest Service BMPs are flexible in that they are tailor-made to account for diverse combinations of physical and biological environmental circumstances. A final test of the effectiveness of the Forest Service BMPs is their demonstrated ability to protect the beneficial uses of the surface waters in the State. The BMPs incorporate years of erosion control and watershed protection experience and are based on sound scientific principles.

The land treatment measures incorporated into Forest Service BMPs evolved through extensive research and development, and have been monitored and modified over several decades with the expressed purpose of improving the measures and making them more effective.

## E.2 SPECIFIC BMP MEASURES

Soil and water resources and water-related beneficial uses are best protected during land disturbing activities from nonpoint source pollution by use of site-specific soil and water conservation practices. These are developed in an interdisciplinary process. This process places emphasis for maintenance and protection of these resources and uses on the application of the site-specific practices, monitoring successes and failures, and adjusting the practices and/or evaluation criteria until the resources are protected.

The following table lists BMPs that will be applied to the various activities associated with the exploration, development, and production of oil and gas resources in the project area. This list will be reviewed, and the applicable BMPs will be made a part of the Conditions of Approval (COAs) at the time that an Application for Permit to Drill (APD) is made by the lessee/operator.

| BMP No. | Best Mgmt. Practice | Intent of Site Specific BMPs to be Included in COAs |
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| 11.07 | Oil and Hazardous Substance Spill Contingency Planning | Requires the lessee/operator to prepare a HAZMAT Contingency Plan, which directs actions to be taken to prevent the contamination of waters from the accidental spill of hazardous materials. The plan includes coordination to be established in the event of an accidental spill and actions to be taken for the identification, cleanup, and disposal of contaminated materials. The Custer National Forest has a Contingency Plan for use and direction in the event of a serious oil or gas emergency. |
| 11.11 | Petroleum Storage and Delivery Facilities and Management | Petroleum delivery and storage facilities will be located, designed, constructed, and maintained in a manner that minimizes the potential for contamination of surface and subsurface soil and water resources from leaking flow lines, pipelines, and storage tanks. Roads, vegetative manipulation, and other considerations should be evaluated in the construction and maintenance of these facilities. |
| 13.03 | Tractor Operation Excluded from Wetlands, Bogs, and Wet Meadows | To prevent soil puddling, compaction, and displacement, and the concentration of surface water and soil erosion, which may lead to rill or gully erosion and subsequent water quality degradation. This measure is intended to prevent or reduce the need for corrective measures to solve water concentration problems due to tractor use. |
| 13.04 | Revegetation of Surface Disturbed Areas | Disturbed areas are revegetated to protect the surface from erosion. Vegetation species are selected to meet many or most of the management objectives for the area: range, wildlife, timber, fuels, minerals, aesthetics, and so forth. Grass or browse species may be seeded between recently planted trees for erosion prevention, wildlife habitat enhancement, or other management needs. |
| 14.05 | Protection of Unstable Areas | Construction activities are modified to buffer and protect unstable lands to prevent triggering mass slope failure and resultant erosion and sedimentation. |
| 14.13 | Special Erosion Prevention Measures on Areas Disturbed by Harvest Activities | This provision is used for special soil stabilization problems on soils that are not expected to be revegetated by the normal methods described in BMP 13.04. Such practices as mulching with straw may be needed to establish an adequate cover of grass on problem soils. This BMP was originally for timber harvesting but applies to this project as well. |
| 15.02 | General Guidelines for the Location and Design of Roads and Trails | Guidelines are given for locating stream and drainage crossings, and for development of road construction standards to minimize damage to water resources. |

| BMP No. | Best Mgmt. Practice | Intent of Site Specific BMPs to be Included in COAs |
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| 15.03 | Road and Trail Erosion Control Plan | An erosion control plan is developed by the lessee to identify erosion prevention methods to be used for road, well pad, and pipeline construction and maintenance. This plan incorporates the appropriate BMPs (such as 13.03, 13.04, and 14.13) for landscape, climate, and other local factors. |
| 15.04 | Timing of Construction Activities | Equipment shall not be operated during wet periods or when ground conditions are such that excessive impacts will result. The lessee must schedule and conduct operations to prevent erosion and sedimentation. Also, erosion control work must be kept current when road construction occurs outside of the normal operating season. |
| 15.05 | Slope Stabilization and Prevention of Mass Failures | Specifications are given for structural and biological stabilization of cuts and fills of roads. Standards are given for using structural and biological measures to stabilize road cuts and fills. A schedule must be created for inspecting road construction and maintenance work. |
| 15.09 | Timely Erosion Control Measures on Incomplete Roads and Streamcrossing Projects | Measures are identified for use between storms or during rainy seasons to prevent erosion. A common measure is to construct temporary silt-fence dams in critical areas to catch sediment from incomplete construction, before it enters drainage. |
| 15.10 | Control of Road Construction Excavation and Sidecast Material | If cut and fill areas fail and block roads, methods of disposing of the material are designated to prevent the material from being dumped off the side of the road into the streams. |
| 15.11 | Servicing and Refueling of Equipment | Measures are developed to prevent hazardous materials, such as gasoline and oil, from entering watercourses. |
| 15.12 | Control of Construction in Riparian Areas | Road or trail projects are designed to include site-specific recommendations for the prevention of sedimentation and other stream damage. |
| 15.13 | Controlling In-Channel Excavation | Specifications are given for construction or removal of culverts and bridges only at crossings designated by the Forest Service. |
| 15.14 | Diversion of Flows Around Construction Sites | Ensures that stream diversions are planned to minimize downstream sedimentation and protect fish habitat. |
| 15.15 | Stream crossings on Temporary Roads | Standards are provided for temporary roads to ensure that they are properly drained to prevent erosion, and so that they cross streams in designated places. |
| 15.16 | Bridge and Culvert Installation (Disposition of Surplus Material and Protection of Fisheries) | These are standards for locating and constructing bridges and culverts to prevent water pollution and injury to fish habitat. |

| BMP No. | Best Mgmt. Practice | Intent of Site Specific BMPs to be Included in COAs |
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| 15.17 | Regulation of Borrow Pits, Gravel Sources and Quarries | Gravel borrow areas are designated so stream course materials are not randomly used for surfacing roads or well pads. |
| 15.18 | Disposal of Right-of-Way and Roadside Debris | Specifications are given for disposing of vegetation, rock, and soils not needed for construction to prevent deleterious materials from being discharged into streams. |
| 15.19 | Streambank Protection | Specifications are given for stabilization of stream embankments disturbed by the construction of a water crossing or a roadway fill to prevent erosion of the material during natural stream flow. |
| 15.20 | Water Source Development Consistent With Water Quality Protection | Guidance is provided for developing water sources needed to supply water for road construction and dust control. |
| 15.21 | Maintenance of Roads | Provides for road maintenance plan and inspections to ensure that project roads and well pads do not, over time, contribute to water pollution. |
| 15.22 | Road Surface Treatment to Prevent Loss of Materials | Road surface treatments, such as penetration oiling, sealing, aggregate surfacing, chip-sealing, or paving, may be required to prevent water pollution from road surface erosion and traffic. |
| 15.23 | Traffic Control During Wet Periods | Guidance for controlling road use during wet periods that would damage the road surface and drainage system and make erosion prevention measures ineffective; and for applying BMP 15.21. |
| 15.24 | Snow Removal Controls | Provides guidance for removing snow to protect the road surface from damage that could result in water pollution. |
| 16.02 | Administration of Bureau of Land management Issued permits, Licenses, or Leases for Mineral Exploration and Extraction on National Forest System Lands | Ensures that soil and water resources are protected during mineral exploration, extraction, processing, and reclamation activities conducted on National Forest System lands under the terms of Bureau of Land Management prospecting permits, coal exploration licenses, and mineral leases. |
| 16.06 | Reclamation of Oil and Gas Well Sites | Provides for development of reclamation plans prior to leasing. |
| 16.07 | Reserve Pit Location, Design, Operation, and Reclamation | Ensures that reserve pits are located, operated, and reclaimed so as to prevent adverse effects on surface and ground water resources. |
| 16.08 | Oil and Gas Well Blowout Contingency Plan | Requires individual operators to provide Blowout Contingency Plans for emergency situations. |

Source: Best Management Practices to Protect Water Quality and Soil Productivity for Areas Where Leasing is Approved (*Forest Service R-1 Handbook*: FSH 2509.22 - Soil And Water Conservation Practices Handbook, R-1/R-4 Amendment No. 1, Effective 05/88. Chapter 10 - Soil and Water Conservation Practices Documentation).